O-2000
OPERATE THE AIRCRAFT FM RADIO

CONDITIONS

You are a Mission Pilot trainee and must demonstrate how to operate the CAP VHF FM radio.

OBJECTIVES

Demonstrate and discuss the use of the CAP VHF FM radio, and discuss CAP-specific communications.

TRAINING AND EVALUATION

Training Outline

1. As a Mission Pilot trainee, knowing how to set up and use the VHF FM radio is essential. This radio enables you to communicate effectively with mission base and ground units. Observers and scanners will normally operate the FM radio.

2. *Aviation communications radios*. Some aviation frequencies are designed for air-to-air communications and may be used by CAP aircraft (or any other general aviation aircraft). 123.1 MHz is the official SAR frequency. 122.75 and 122.85 MHz are air-to-air communications frequencies (and for use by private airports not open to the general public). 122.90 MHz is the Multicom frequency; it *can* be used for search and rescue, *but* is also used for other activities of a temporary, seasonal or emergency nature (note, however, that it is also used by airports without a tower, FSS or UNICOM). Follow your communications plan, if applicable, and don't abuse these frequencies. Look at the sectional to see if 122.90 MHz is used by nearby airports, and always listen before you transmit.

3. *Callsigns*. CAP aircraft have been authorized to use FAA callsigns, just like the major airlines and commuter air carriers. This helps differentiate us from civil aircraft, air taxis, and many other commercial aircraft. Our FAA authorized callsign is "Cap Flight XX XX," where the numbers are those assigned to each Wing's aircraft. *The numbers are stated in 'group' form*. For example, the C172 assigned to Amarillo, Texas is numbered 4239, where 42 is the prefix identifying it as a Texas Wing aircraft. The callsign is thus pronounced "Cap Flight Forty-Two Thirty-Nine." It is important to use the group form of pronunciation because FAA air traffic controllers expect it of us. [NOTE: There are a few exceptions to this rule, such as when you perform certain counter drug operations. In these rare cases you may be directed to use the aircraft 'N' number as your callsign.]

[NOTE: CAP aircraft should use the word "Rescue" in their callsign when priority handling is *critical*. From the example above, this would be "Cap Flight Forty-Two Thirty-Nine Rescue." DO NOT abuse the use of this code; it should only be used when you are on a critical mission *and* you need priority handling. NEVER use the word "rescue" during training or drills.]

4. *CAP VHF FM radio*. CAP has authorization to use special frequencies in order to communicate with government agencies and our own ground forces. For this purpose CAP aircraft have a VHF FM radio that is separate from the aviation comm radios. This radio is primarily dedicated to air-to-ground communications and is normally operated by the observer or scanner. Several of the frequencies programmed into the radio are frequencies assigned to CAP by the U.S. Air Force, and are used to communicate with CAP bases and ground teams. Others are programmed at the direction of the Wing Communications Officer (e.g., mutual aid, fire, police, park service, forest service, and department of public service); these frequencies almost always require prior permission from the controlling agency before use. [CAP is replacing the older Yaesu and NAT NPX138 radios with the TDFM-136. NPX138 operation is outlined in Attachment 2 of the MART.]

The TDFM-136 is a P25-compliant airborne transceiver capable of operating in the 136 MHz to 174 MHz range (digital or analog) in 2.5 KHz increments. It can have up to 200 operator-accessible memory positions, each capable of storing a receive frequency, a transmit frequency, a separate tone for each receive and transmit frequency, an alphanumeric identifier for each channel, and coded squelch information for each channel. Data can be entered via the 12-button keypad but is normally downloaded from a PC. Operating frequencies, alphanumeric identifiers and other related data are presented on a 96-character, four-line LED matrix display. It is capable of feedback encryption.

National will enter the first four main frequencies (Primary, Secondary, Ground Tactical and Air-to-Ground) and the wing communications officers will enter the rest. Guard 1 will be preset to the Air-to-Ground and Guard 2 to the Primary frequency. Therefore, all you will just have to know is how to *use* the radio. The radio also has a scan function that can scan any or all of the main channels stored in the preset scan lists; scan lists, if enabled, are set by the wing communications officer.

As shown in the figure, the radio simultaneously displays two frequencies. The upper line is the Main (MN) frequency and the lower is the Guard (GD) frequency. Normally, you will be set up to transmit and receive on the Main and be able to receive the Guard frequency. This feature allows mission base to contact you at any time (via Guard), no matter what frequency you are using (Main).

Controls and normal settings:

a. The knob above the MN/GD switch is the power switch and controls volume for Main. The knob above the G1/G2 switch is the volume control for Guard.
b. The "Squelch" pushbutton is not used (automatic squelch). *Don't push it.*
c. The MN/GD toggle switch selects the frequency on which you will transmit *and* receive. It is normally set to MN.
d. The G1/G2 toggle switch selects the Guard frequency you are *monitoring* (G1 = Air-to Ground and G2 = Primary). It is normally set to G1.
e. The HI/LO toggle switch selects transmitter power (10 watts or 1 watt). It is normally set to HI.

Keypad operation:

a. Pressing and holding "4" (Scroll Memory Down) will let you scroll down through the programmed memories (it wraps around). Upon reaching the desired entry, release the button. "6" (Scroll Memory Up) lets you scroll up. [Note: scroll speed increases the longer you hold the buttons.]
b. Pressing "5" (Scan) lets you select a scan list to scan, and to start or stop the scan. Once the scan list you want is displayed press # ENTER to start the scan or press * ESC to stop the scan. [Note: this function must be enabled by the wing communications officer for it to work.}
c. Pressing and holding "2" (Display - Brighter) will increase display brightness; "8" (Display - Dimmer) decreases brightness.

When you get in the aircraft and power up the radio it should be set to MN, G1 and HI. Use pushbutton 4 or 6 to select the assigned Main frequency (normally Air-to-Ground), and "004 Air/Grd 149.5375" will be displayed on the upper line. The second line should display the Guard 1 frequency (in this case, the same as Main).

As another example, lets say you are working with the U.S. Forest Service and have their frequency on Main. Mission base, noting that you have not called in your "Operations Normal" report, calls you using the G1 frequency. You will hear mission base over Guard (its set to G1), regardless of what is coming over the Main frequency. You simply take the MN/GD switch to GD and answer "Ops Normal," and then return the switch to MN and carry on with the mission.

5. *Required FM radio reports*. As a minimum, the aircrew must report the following to mission base:
a. Radio check (initial flight of the day)
b. Take off time ("wheels up")
c. Time entering a search area
d. Time exiting a search area
e. Landing time ("wheels down")
f. Operations normal ("Ops Normal"), at intervals briefed by mission staff

Additional Information

This task may be performed in conjunction with Task O-2001 (audio panel). More detailed information on this topic is available in Chapter 4 and Attachment 2 of the MART.

Evaluation Preparation

Setup: Provide the student access to aircraft radios.

Brief Student: You are a Mission Pilot trainee asked to set up and use the CAP VHF FM radio, and discuss other CAP-specific communications.

NOTE: The performance measures are designed for the TDFM-136; adjust as necessary for your aircraft.

Evaluation

Performance measures	Results	
1. Concerning the aircraft communications radio, discuss:		
a. Frequencies available for SAR/DR use.	P	F
b. Proper use of CAP callsigns, including when to use "rescue".	P	F
2. Set up and use the CAP VHF FM radio:		
a. Power, volume and squelch controls.	P	F
b. Select assigned frequencies (main and guard channels).	P	F
c. Keypad controls (scroll and scan).	P	F
d. Give required mission FM radio reports (may be simulated).	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.